Dell Latitude E6520 Owner's Manual

Regulatory Model P15G
Regulatory Type P15G001

Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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Rev. A00

Contents

Working on Your Computer 1

Before Working Inside Your Computer

Use the following safety guidelines to help protect your computer from potential damage and to help to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

- You have performed the steps in Working on Your Computer.
- You have read the safety information that shipped with your computer.
- A component can be replaced or--if purchased separately--installed by performing the removal procedure in reverse order.

WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface, such as a connector on the back of the computer.

CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

NOTE: The color of your computer and certain components may appear differently than shown in this document.

To avoid damaging your computer, perform the following steps before you begin working inside the computer.

1. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
2. Turn off your computer (see *Turning Off Your Computer*).
3. If the computer is connected to a docking device (docked) such as the optional Media Base or Battery Slice, undock it.

CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

4. Disconnect all network cables from the computer.
5. Disconnect your computer and all attached devices from their electrical outlets.
6. Close the display and turn the computer upside-down on a flat work surface.

NOTE: To avoid damaging the system board, you must remove the main battery before you service the computer.

7. Remove the main battery (see *Battery*).
8. Turn the computer top-side up.
9. Open the display.
10. Press the power button to ground the system board.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the display.

CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

11. Remove any installed ExpressCards or Smart Cards from the appropriate slots.

Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver

- #0 Phillips screwdriver
- #1 Phillips screwdriver
- Small plastic scribe
- Flash BIOS update program CD

Turning Off Your Computer

CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.

1. Shut down the operating system:

    - In Windows Vista :

      Click **Start** , then click the arrow in the lower-right corner of the **Start** menu as shown below, and then click **Shut Down**.

    - In Windows XP:

      Click **Start** → **Turn Off Computer** → **Turn Off** . The computer turns off after the operating system shutdown process is complete.

2. Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 4 seconds to turn them off.

After Working Inside Your Computer

After you complete any replacement procedure, ensure you connect any external devices, cards, and cables before turning on your computer.

CAUTION: To avoid damage to the computer, use only the battery designed for this particular Dell computer. Do not use batteries designed for other Dell computers.

1. Connect any external devices, such as a port replicator, battery slice, or media base, and replace any cards, such as an ExpressCard.
2. Connect any telephone or network cables to your computer.

CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

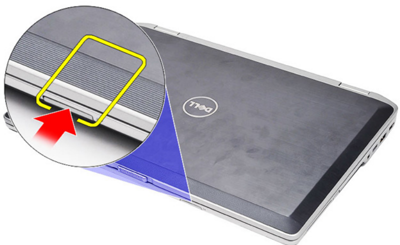
3. Replace the battery.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

Secure Digital (SD) Card

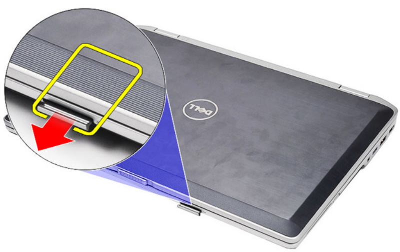
2

Removing The Secure Digital (SD) Card

1. Follow the procedures in *Before Working On Your Computer*.
2. Press in on the SD card to release the it from the computer.



3. Grasp the SD card and pull out to release from the computer.



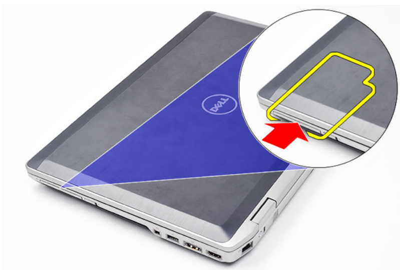
Installing The Secure Digital (SD) Card

1. Slide the SD card into its slot until it clicks into place.
2. Follow the procedures in *After working inside your computer*.

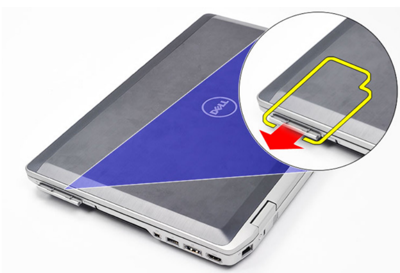
ExpressCard 3

Removing the ExpressCard

1. Follow the procedures in *Before Working On Your Computer*.
2. Press in on the ExpressCard to release it from the computer.



3. Slide the ExpressCard out of the computer.



Installing the ExpressCard

1. Slide the ExpressCard into its slot until it clicks into place.
2. Follow the procedures in *After Working Inside Your Computer*.

Modem Connector Plug

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Removing The Modem Connector Plug

1. Follow the procedures in *Before Working On Your Computer*.
2. Insert a paper clip into the hole to pop out the modem connector plug.



Installing The Modem Connector Plug

1. Insert and push in the modem connector plug into the modem port.
2. Follow the procedures in *After Working Inside Your Computer*.

Battery 5

Removing The Battery

1. Follow the procedures in *Before Working On Your Computer*.
2. Slide the release latches to unlock the battery.



3. Rotate the outer edge of the battery upward and remove it from the computer.



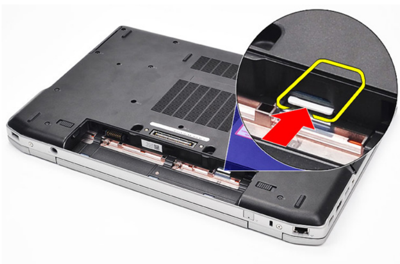
Installing The Battery

1. Slide the battery into its slot until it clicks into place.
2. Follow the procedures in *After Working Inside Your Computer*.

Subscriber Identity Module (SIM) Card 6

Removing The Subscriber Identity Module (SIM) Card

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Press in on the SIM card to release it from the computer.



4. Grasp the SIM card and pull out to release from the computer.



Installing The Subscriber Identity Module (SIM) Card

1. Slide the SIM card into its compartment.
2. Replace the *battery*.
3. Follow the procedures in *After Working Inside Your Computer*.

Hard Drive

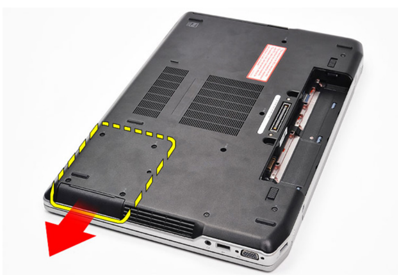
7

Removing The Hard Drive

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the screws that secure the hard drive to the computer.



4. Slide the hard drive out of the computer.



5. Remove the screw that secures the hard-drive caddy to the hard drive.



6. Pull and remove the hard-drive caddy away from the hard drive.



Installing The Hard Drive

1. Attach the hard-drive caddy to the hard drive.
2. Tighten the screws to secure the hard-drive caddy to the hard drive.
3. Slide the hard drive into the computer.
4. Replace and tighten the screws to secure the hard drive to the computer.
5. Install the *battery*.
6. Follow the procedures in *After working inside your computer*.

Optical Drive

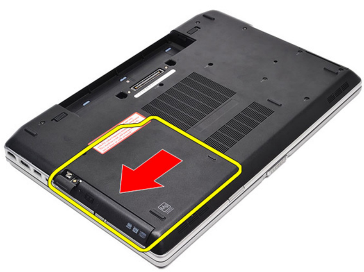
8

Removing The Optical Drive

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Press and release the optical drive latch



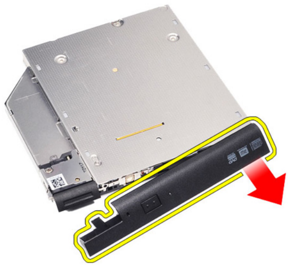
4. Pull the optical drive out of the computer.



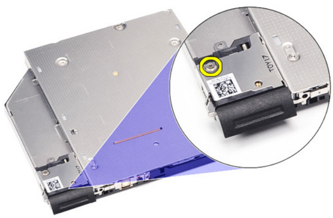
5. Pull the optical drive door from one side to release it.



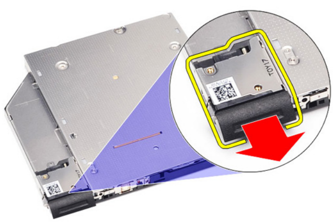
6. Pull the other side of the optical drive door to release it completely from the optical drive.



7. Remove the screw that secures the drive latch to the optical drive.



8. Remove the drive latch from the optical drive.



9. Remove the screws that secures the drive latch bracket to the optical drive.



10. Remove the drive latch bracket from the optical drive.



Installing The Optical Drive

1. Replace the drive latch bracket on the optical drive.
2. Replace and tighten the screws to secure the drive latch bracket to the optical drive.
3. Replace the drive latch on the optical drive.
4. Replace the screw to secure the drive latch to the optical drive.
5. Push in the left side of the optical drive door till it clicks in place in the optical drive.
6. Push in the right side of the optical drive door.
7. Insert the optical drive into the computer.
8. Push in the eject handle on the optical drive till it clicks in place.
9. Install the *battery*.
10. Follow the procedures in *After working inside your computer*.

Base Cover

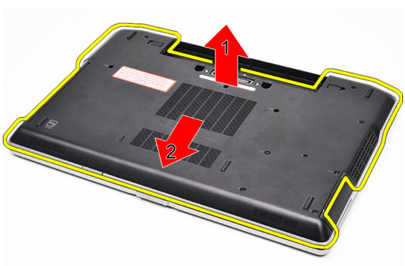
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Removing The Base Cover

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the screws that secure the base cover to the computer.



4. Lift from the back of the computer and slide towards the front of the computer.



5. Remove the base cover from the computer.



Installing The Base Cover

1. Place the base cover to align the screw holes correctly with the computer.
2. Tighten the screws to secure the base cover to the computer.
3. Install the *battery*.
4. Follow the procedures in *After Working Inside Your Computer*.

Memory

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Removing The Memory

1. Follow the procedures in *Before Working On Your Computer*
2. Remove the *battery*.
3. Remove the *secure digital (SD) Card*.
4. Remove the *base cover*.
5. Pry the retention clips away from the memory module until it pops up.



6. Remove the memory module.



Installing The Memory

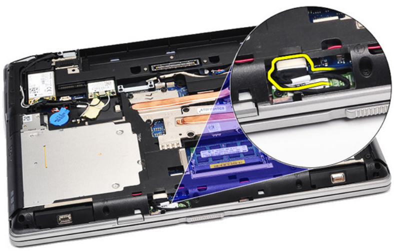
1. Insert the memory into the memory socket.
2. Press the clips to secure the memory module to the system board.
3. Install the *base cover*.
4. Install the *secure digital (SD) Card*.
5. Install the *battery*.
6. Follow the procedures in *After Working Inside Your Computer*.

Bluetooth Card

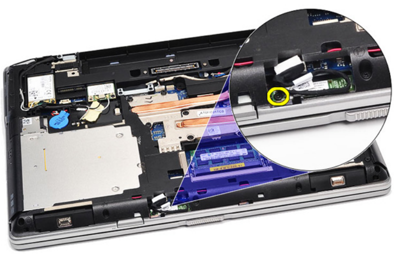
11

Removing Bluetooth Card

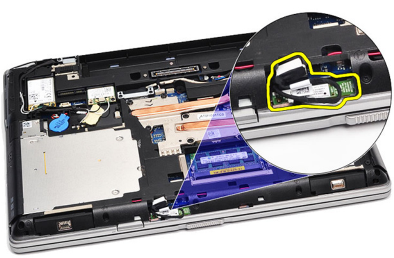
1. Follow the procedures in *Before Working on Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Disconnect the Bluetooth cable from the system board.



5. Remove the screw that secures the Bluetooth card to the system board.



6. Lift and remove the Bluetooth card from the computer.



7. Disconnect the Bluetooth cable from the Bluetooth card.



Installing The Bluetooth Card

1. Connect the bluetooth cable to the bluetooth card.
2. Connect the other end of the bluetooth cable to the system board.
3. Place the Bluetooth card in its location in the computer.
4. Replace and tighten the screw to secure the Bluetooth card to the system board.
5. Install the *base cover*.
6. Install the *battery*.
7. Follow the procedures in *After Working Inside Your Computer*.

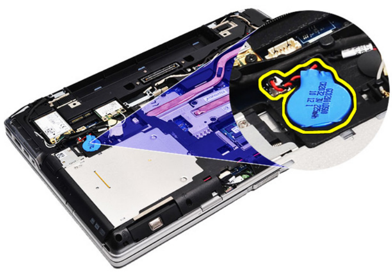
Coin-Cell Battery 12

Removing The Coin-Cell Battery

1. Follow the procedures in *Before Working on Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Disconnect the coin-cell battery cable from the system board.



5. Release and remove the coin-cell battery from the computer.



Installing The Coin-Cell Battery

1. Attach the coin-cell battery cable to its connector on the system board.
2. Attach the coin-cell battery to its compartment.
3. Install the *base cover*.
4. Install the *battery*.
5. Follow the procedures in *After working inside your computer*.

Modem Card

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Removing The Modem Card

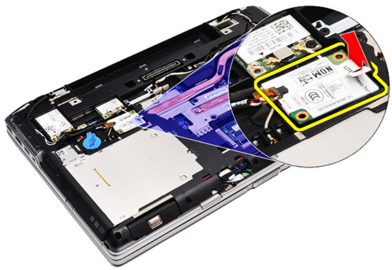
1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Disconnect the connector that secures the modem card to the system board.



5. Remove the screw securing the modem to the system.



6. Lift and remove the modem card from the computer.



Installing The Modem Card

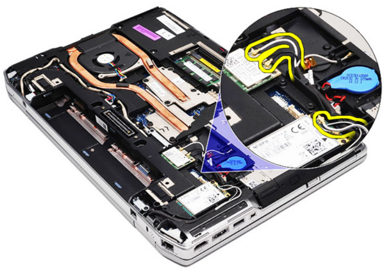
1. Fasten the connector attaching the modem card to the system board.
2. Insert the modem into its compartment and press on the module to connect it to the system board.
3. Connect the modem cable to the system board.
4. Tighten the screw to secure the modem card to the computer.
5. Install the *base cover*.
6. Install the *battery*.
7. Follow the procedures in *After working inside your computer*.

Modem Connector

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Removing The Modem Connector

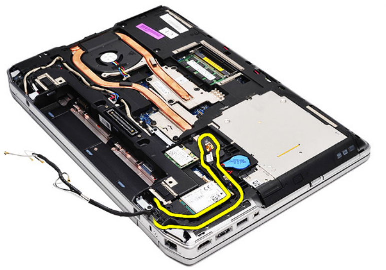
1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *secure digital (SD) Card*.
4. Remove the *base cover*.
5. Remove the *modem card*.
6. Disconnect the antenna cables.



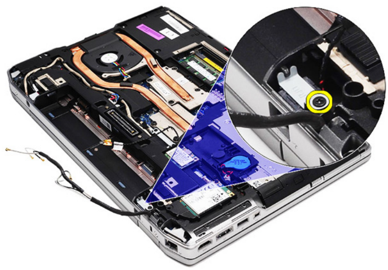
7. Unthread the antenna cables from the route.



8. Unthread the modem cable.



9. Remove the screw that secures the modem connector bracket.



10. Remove the modem connector bracket.



11. Remove the modem connector.



Installing The Modem Connector

1. Align the modem connector to its original position.
2. Align the modem bracket to its original position.
3. Tighten the screw to secure the modem bracket.
4. Route and connect the modem cable.
5. Route and connect the antenna cables.
6. Install the *modem card*.
7. Install the *base cover*.
8. Install the *secure digital (SD) Card*.
9. Install the *battery*.
10. Follow the procedures in *After Working Inside Your Computer*.

Wireless Local Area Network (WLAN) Card 15

Removing The Wireless Local Area Network (WLAN) Card

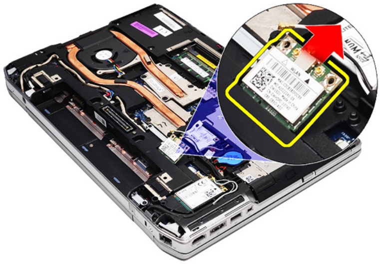
1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Disconnect the antenna cables from the WLAN card.



5. Remove the screw that secures the WLAN card to the computer.



6. Remove the WLAN card from its slot on the system board.



Installing The Wireless Local Area Network (WLAN) Card

1. Insert the WLAN card into its connector at a 45–degree angle into its slot.
2. Connect the antenna cables to their respective connectors marked on the WLAN card.
3. Replace and tighten the screw to secure the WLAN card to the computer.
4. Install the *base cover*.
5. Install the *battery*.
6. Follow the procedures in *After Working Inside Your Computer*.

Wireless Wide Area Network (WWAN) Card

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Removing The Wireless Wide Area Network (WWAN) Card

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Disconnect the antenna cables from the WWAN card.



5. Remove the screw that secures the WWAN card to the computer.



6. Remove the WWAN card from the computer.



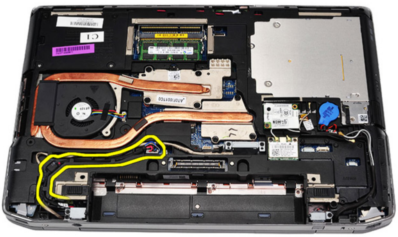
Installing The Wireless Wide Area Network (WWAN) Card

1. Insert the WWAN card into its connector at a 45–degree angle into its slot.
2. Connect the antenna cables to their respective connectors marked on the WWAN card.
3. Replace and tighten the screw to secure the WWAN card to the computer.
4. Install the *base cover*.
5. Install the *battery*.
6. Follow the procedures in *After Working Inside Your Computer*.

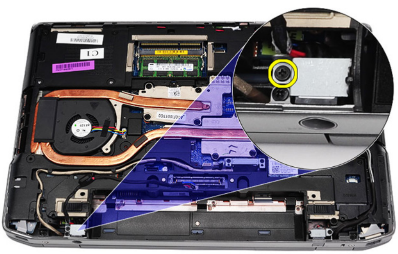
Power Connector 17

Removing The Power Connector

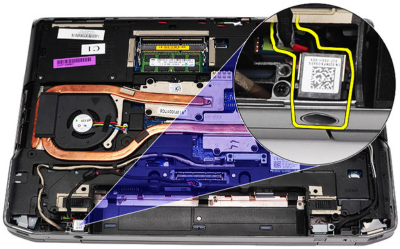
1. Follow the procedures in *Before Working on Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Disconnect and remove the power connector cable from the route.



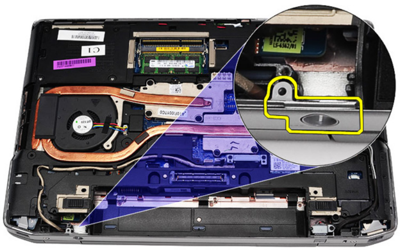
5. Remove the screw that secures the power connector bracket to the computer.



6. Remove the power connector port from the computer.



7. Remove the power connector trim.



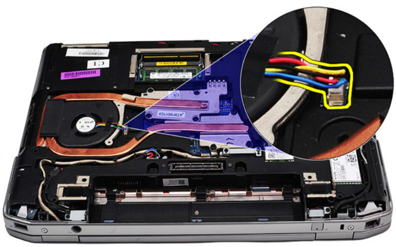
Installing The Power Connector

1. Align the power connector port trim in its original position.
2. Tighten the screw to secure the power connector trim to the computer.
3. Insert the power connector in its compartment.
4. Install the power connector bracket in its place and tighten the screw to secure its position.
5. Connect the power connector to the system board.
6. Connect and route the power connector cable.
7. Remove the *base cover*.
8. Remove the *battery*.
9. Follow the procedures in *After Working Inside Your Computer*.

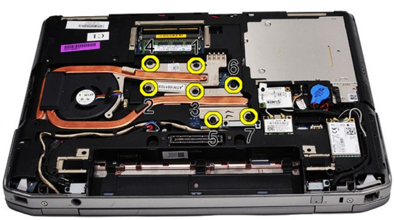
Heat Sink 18

Removing The Heat-Sink

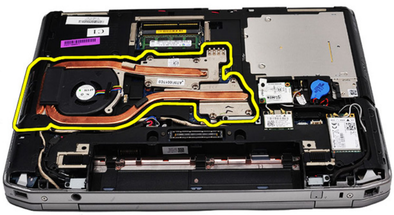
1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Disconnect the heat-sink cable from the system board.



5. Remove the screws that secure the heat-sink assembly to the system board.



6. Lift up to raise the right side of the heat-sink and slide the heat-sink sideways to remove from the system board.



Installing The Heat-Sink

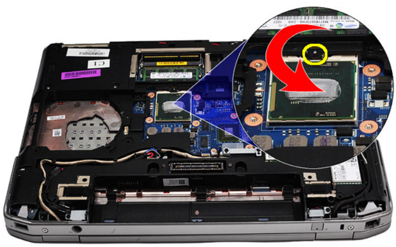
1. Slide the heat-sink into its original position in the system board.
2. Tighten the screws to secure the heat-sink assembly to the system board.
3. Connect the heat-sink cable to the system board.
4. Install the *base cover*.
5. Install the *battery*.
6. Follow the procedures in *After Working Inside Your Computer*.

Processor

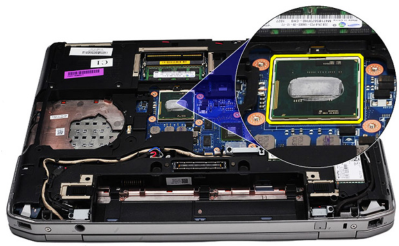
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Removing The Processor

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Remove the *heat-sink*.
5. Rotate the processor cam lock in a counter-clockwise direction.



6. Lift up and remove the processor from the system board.



Installing The Processor

1. Align the notches on the processor and the socket.
2. Slide the processor into the socket.
3. Rotate the processor cam lock in a clockwise direction.
4. Install the *heat-sink*.
5. Install the *base cover*.
6. Install the *battery*.
7. Follow the procedures in *After Working Inside Your Computer*.

Keyboard Trim

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Removing The Keyboard Trim

1. Follow the procedures in *Before Working On Your Computer*.
2. Using a plastic scribe, pry under the keyboard trim to release it from the computer.



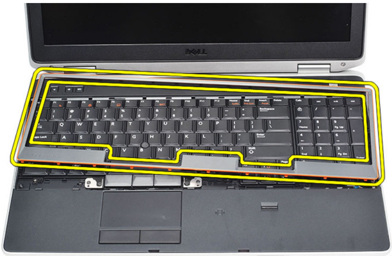
3. Lift the keyboard trim to release the tabs.



4. Pry up the keyboard trim from the bottom center.



5. Lift up to remove the keyboard trim from the computer.



Installing The Keyboard Trim

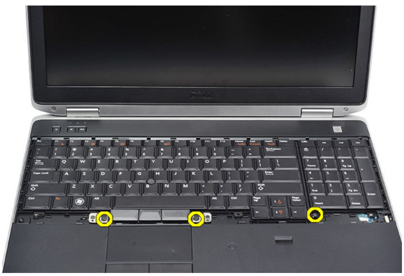
1. Align the keyboard trim to its compartment.
2. Press along the sides of the keyboard trim until it snaps in place.
3. Follow the procedures in *After Working Inside Your Computer*.

Keyboard

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Removing The Keyboard

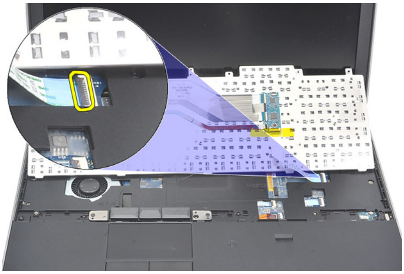
1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *keyboard trim*.
3. Remove the *battery*.
4. Remove the *base cover*.
5. Remove the screws that secure the keyboard to the palm rest assembly



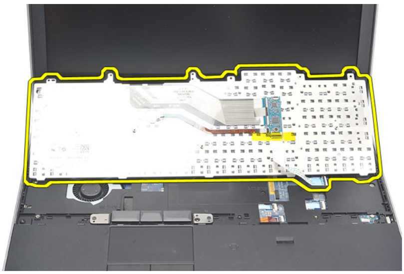
6. Flip the keyboard over.



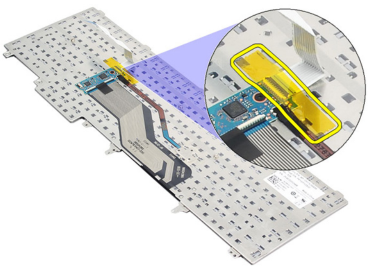
7. Lift the clip to release the keyboard cable and disconnect it from the computer



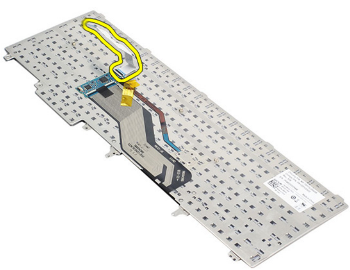
8. Remove the keyboard from the system board.



9. Remove the tape that secures the keyboard cable from the keyboard.



10. Disconnect and remove the keyboard data cable from the keyboard.



Installing The Keyboard

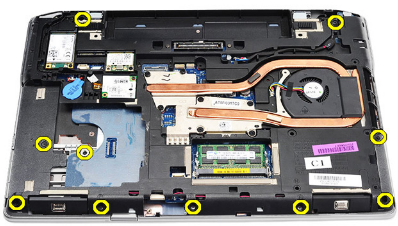
1. Connect the keyboard cable and secure it to the keyboard using the tape.
2. Slide the keyboard into its compartment until all the metal tabs fit into their positions.
3. Press down on the keyboard to the left and right side ensuring that all the snaps are fully engaged with the computer.
4. Fasten the keyboard cable clip.
5. Replace and tighten the screws to secure the keyboard to the palm rest.
6. Install the *base cover*.
7. Install the *battery*.
8. Install the *keyboard trim*.
9. Follow the procedures in *After Working Inside Your Computer*.

Palm Rest

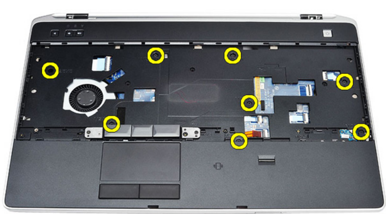
22

Removing The Palm Rest Assembly

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Remove the *display assembly*.
5. Remove the *optical drive*.
6. Remove the *hard drive*.
7. Remove the *bluetooth*.
8. Remove the *keyboard trim*.
9. Remove the *keyboard*.
10. Remove the screws that secure the palm rest assembly to the computer.



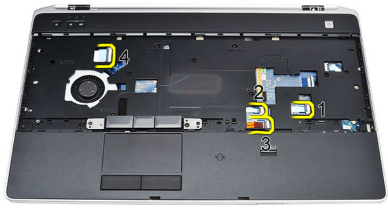
11. Flip the computer and remove the screws from the system board.



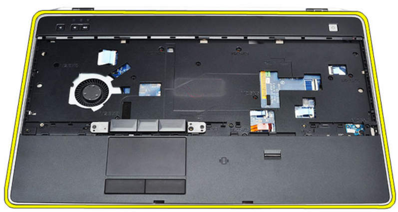
12. Disconnect the following cables from the system board :

    - fingerprint sensor

- Radio Frequency Identification (RFID) sensor
- touch pad
- media board



13. Lift the palm rest at a 45-degree angle and remove it.



Installing The Palm Rest Assembly

1. Align the palm rest assembly to its original position in the computer and snap it into place.
2. Connect the following cables to the system board:

   - fingerprint sensor
   - Radio Frequency Identification (RFID) sensor
   - touch Pad

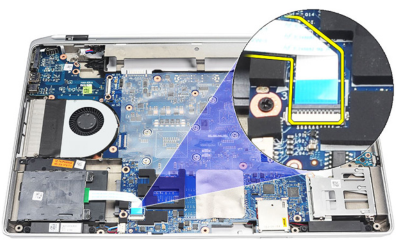
- media board

3. Replace and tighten the screws to secure the palm rest assembly to the computer.
4. Install the *keyboard*.
5. Install the *keyboard trim*.
6. Install the *Bluetooth*.
7. Install the *hard drive*.
8. Install the *optical drive*.
9. Install the *display assembly*.
10. Install the *base cover*.
11. Install the *battery*.
12. Follow the procedures in *After Working Inside Your Computer*.

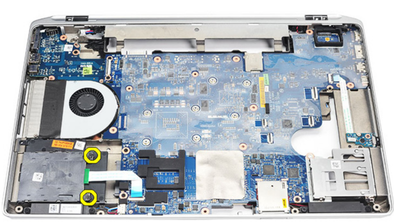
Smart Card Reader 23

Removing the Smart Card Reader

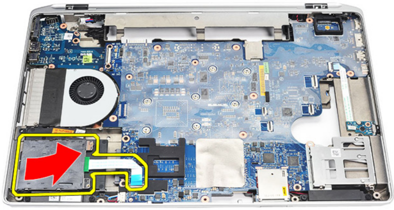
1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Remove the *display assembly*.
5. Remove the *optical drive*.
6. Remove the *hard drive*.
7. Remove the *bluetooth module*.
8. Remove the *keyboard trim*.
9. Remove the *keyboard*.
10. Remove the *palm rest assembly*.
11. Disconnect the smart card reader cable from the system board.



12. Remove screws from the smart card reader.



13. Remove the smart card reader from the computer.



Installing The Smart Card Reader

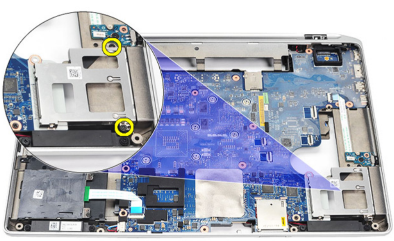
1. Insert the smart card reader in the computer in its original position.
2. Tighten the screws of the smart card reader.
3. Connect the smart card reader cable to the system board.
4. Install the *palm rest assembly*.
5. Install the *keyboard*.
6. Install the *keyboard trim*.
7. Install the *bluetooth module*.
8. Install the *hard drive*.
9. Install the *optical drive*.
10. Install the *display assembly*.
11. Install the *base cover*.
12. Install the *battery*.
13. Follow the procedures in *After Working Inside Your Computer*.

ExpressCard Cage

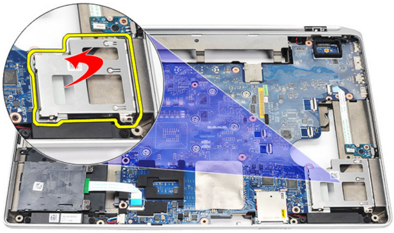
24

Removing The ExpressCard Cage

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *ExpressCard*.
4. Remove the *optical drive*.
5. Remove the *base cover*.
6. Remove the *hard drive*.
7. Remove the *bluetooth*.
8. Remove the *keyboard trim*.
9. Remove the *keyboard*.
10. Remove the *palm rest assembly*.
11. Remove the *display assembly*.
12. Remove the screws securing the ExpressCard cage to the computer.



13. Lift and remove the ExpressCard cage from the computer.



Installing The ExpressCard Cage

1. Insert the ExpressCard cage into its original position.
2. Replace and tighten the screws to secure the ExpressCard cage to the computer.
3. Install the *display assembly*.
4. Install the *palm rest assembly*.
5. Install the *keyboard*.
6. Install the *keyboard trim*.
7. Install the *Bluetooth*.
8. Install the *hard drive*.
9. Install the *base cover*.
10. Install the *optical drive*.
11. Install the *ExpressCard*.
12. Install the *battery*.
13. Follow the procedures in *After working inside your computer*.

Wireless Switch Board 25

Removing The Wireless Switch Board

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Remove the *display assembly*.
5. Remove the *optical drive*.
6. Remove the *hard drive*.
7. Remove the *Bluetooth*.
8. Remove the *keyboard trim*.
9. Remove the *keyboard*.
10. Remove the *palm rest assembly*.
11. Remove the wireless switch cable from the system board.



12. Remove the screw from the system board.



13. Remove the wireless switch board from the computer.



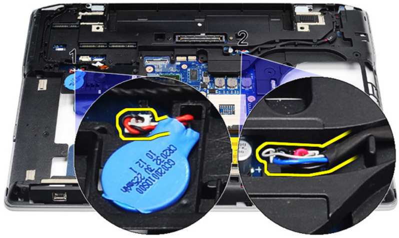
Installing The Wireless Switch Board

1. Align the wireless switch board into its original position in the computer.
2. Tighten the screw on the board.
3. Route and connect the wireless switch cable in the system board.
4. Install the *palm rest assembly*.
5. Install the *keyboard*.
6. Install the *keyboard trim*.
7. Install the *bluetooth*.
8. Install the *hard drive*.
9. Install the *optical drive*.
10. Install the *display assembly*.
11. Install the *base cover*.
12. Install the *battery*.
13. Follow the procedures in *After Working Inside Your Computer*.

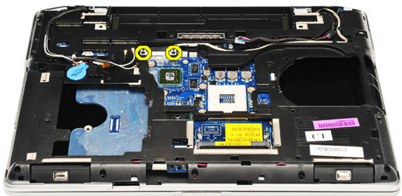
System Board 26

Removing The System Board

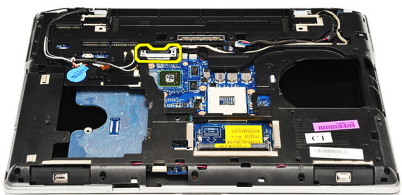
1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *secure digital (SD) Card*.
3. Remove the *ExpressCard*.
4. Remove the *battery*.
5. Remove the *base cover*.
6. Remove the *display assembly*.
7. Remove the *optical drive*.
8. Remove the *hard drive*.
9. Remove the *wireless local area network (WLAN) card*.
10. Remove the *wireless wide area network (WWAN) card*.
11. Remove the *heat-sink*.
12. Remove the *processor*.
13. Remove the *memory*.
14. Remove the *Bluetooth*.
15. Remove the *modem card*.
16. Remove the *keyboard trim*.
17. Remove the *keyboard*.
18. Remove the *palm rest assembly*.
19. Remove the *ExpressCard cage*.
20. Disconnect and release coin-cell battery cable and the power connector cable from the system board.



21. Remove the two screws securing the LVDS bracket.

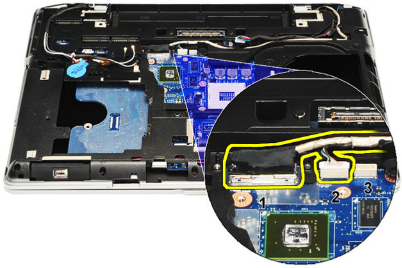


22. Remove the LVDS bracket.



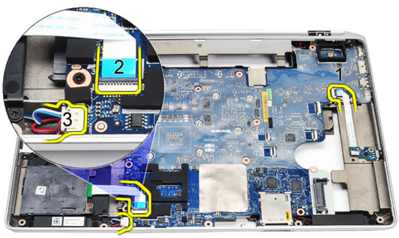
23. Disconnect the following cables from the system board:

- LVDS
- camera/microphone
- touch screen (if applicable)



24. Flip the computer and disconnect the following cables from the system board:

    - wireless switch board
    - smart card reader
    - speaker



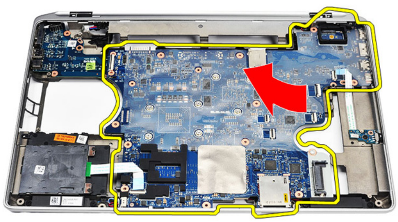
25. Remove the screws from the system board.



26. Detach the top left edge of the system board from the I/O board connector.



27. Lift and slide the system board out of the computer.



Installing The System Board

1. Align the system board into its original position on the computer.
2. Replace and tighten the screws to secure the system board to the computer.
3. Route and connect the following cables the system board:

   - LVDS
   - camera/microphone
   - touchscreen (if applicable)
   - speaker
   - wireless switch board
   - smart card reader
   - coin-cell battery

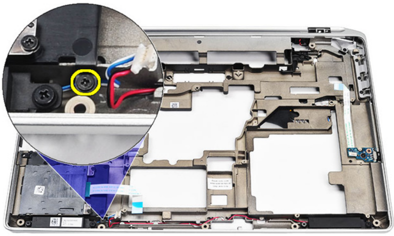
- power connector

4. Install the LVDS bracket and tighten the screws to secure it in place.
5. Install the *ExpressCard Cage*.
6. Install the *palm rest assembly*.
7. Install the *keyboard*.
8. Install the *keyboard trim*.
9. Install the *modem card*.
10. Install the *Bluetooth*.
11. Install the *memory*.
12. Install the *processor*.
13. Install the *heat-sink*.
14. Install the *wireless wide area network (WWAN) card*.
15. Install the *wireless local area network (WLAN) card*.
16. Install the *hard drive*.
17. Install the *optical drive*.
18. Install the *display assembly*.
19. Install the *base cover*.
20. Install the *battery*.
21. Install the *ExpressCard*.
22. Install the *secure digital (SD) Card*.
23. Follow the procedures in *After Working Inside Your Computer*.

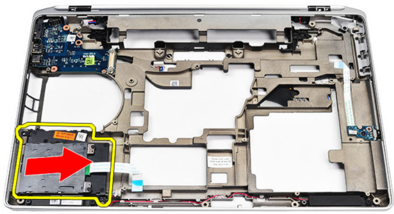
Speaker 27

Removing The Speakers

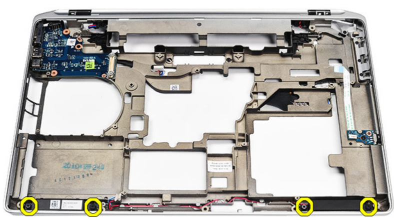
1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *secure digital (SD) Card*.
3. Remove the *ExpressCard*.
4. Remove the *battery*.
5. Remove the *base cover*.
6. Remove the *display assembly*.
7. Remove the *optical drive*.
8. Remove the *hard drive*.
9. Remove the *wireless local area network (WLAN) card*.
10. Remove the *wireless wide area network (WWAN) card*.
11. Remove the *heat-sink*.
12. Remove the *processor*.
13. Remove the *memory*.
14. Remove the *bluetooth*.
15. Remove the *modem card*.
16. Remove the *keyboard trim*.
17. Remove the *keyboard*.
18. Remove the *palm rest assembly*.
19. Remove the *ExpressCard cage*.
20. Remove the *system board*.
21. Remove the screw that secures the hard drive support plate to the computer.



22. Slide and remove the hard drive support plate.



23. Remove the screws that secures the speakers.



24. Unthread the speaker cables and remove the speakers.



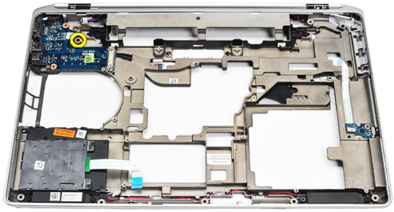
Installing The Speakers

1. Align the speakers in the original position and connect the speaker cables.
2. Tighten the screws to secure the speakers.
3. Slide the hard drive support plate into its position.
4. Tighten the screw to secure the hard drive support plate to the computer.
5. Install the *system board*.
6. Install the *ExpressCard Cage*.
7. Install the *palm rest assembly*.
8. Install the *keyboard*.
9. Install the *keyboard trim*.
10. Install the *modem card*.
11. Install the *Bluetooth*.
12. Install the *memory*.
13. Install the *processor*.
14. Install the *heat sink*.
15. Install the *wireless wide area network (WWAN) card*.
16. Install the *wireless local area network (WLAN) card*.
17. Install the *hard drive*.
18. Install the *optical drive*.
19. Install the *display assembly*.
20. Remove the *base cover*.
21. Remove the *battery*.
22. Install the *ExpressCard*.
23. Remove the *secure digital (SD) Card*.
24. Follow the procedures in *After working inside your computer*.

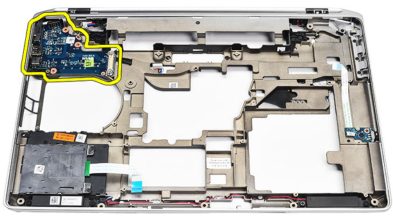
Input/Output Panel 28

Removing The Input/Output (I/O) Panel

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *secure digital (SD) Card*.
3. Remove the *ExpressCard*.
4. Remove the *battery*.
5. Remove the *base cover*.
6. Remove the *display assembly*.
7. Remove the *optical drive*.
8. Remove the *hard drive*.
9. Remove the *wireless local area network (WLAN) card*.
10. Remove the *wireless wide area network (WWAN) card*.
11. Remove the *heat-sink*.
12. Remove the *processor*.
13. Remove the *memory*.
14. Remove the *Bluetooth*.
15. Remove the *modem card*.
16. Remove the *modem connector*.
17. Remove the *keyboard trim*.
18. Remove the *keyboard*.
19. Remove the *palm rest assembly*.
20. Remove the *smart card reader*.
21. Remove the *ExpressCard cage*.
22. Remove the *system board*.
23. Remove the screw that secures the I/O panel to the computer.



24. Lift the I/O panel at a 45-degree angle and remove it from the computer.



Installing The Input/Output (I/O) Panel

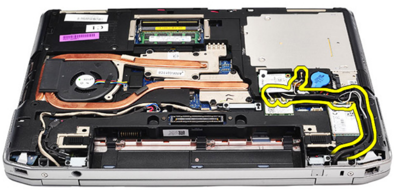
1. Slide in the I/O panel at a 45 degree angle into its original position in the computer.
2. Tighten the screw securing the I/O panel to the computer.
3. Install the *system board*.
4. Install the *ExpressCard Cage*.
5. Install the *smart card reader*.
6. Install the *palm rest assembly*.
7. Install the *keyboard*.
8. Install the *keyboard trim*.
9. Install the *modem connector*.
10. Install the *modem card*.
11. Install the *bluetooth*.
12. Install the *memory*.
13. Install the *processor*.
14. Install the *heatsink*.
15. Install the *wireless wide area network (WWAN) card*.
16. Install the *wireless local area network (WLAN) card*.
17. Install the *hard drive*.
18. Install the *optical drive*.
19. Install the *display assembly*.
20. Install the *base cover*.
21. Install the *battery*.
22. Install the *ExpressCard*.
23. Install the *secure digital (SD) Card*.
24. Follow the procedures in *After Working Inside Your Computer*.

Display Assembly

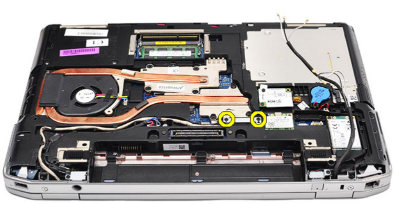
29

Removing The Display Assembly

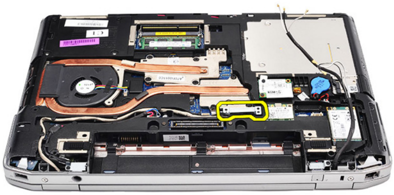
1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *base cover*.
4. Release the antenna cables from the computer.



5. Remove the screws that secures the low-voltage differential signaling (LVDS) support bracket.

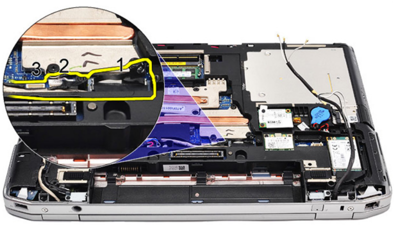


6. Lift up and remove the LVDS support bracket.

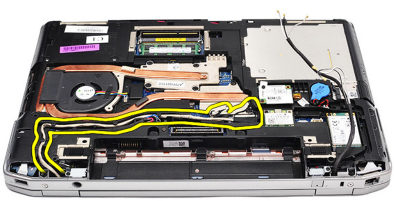


7. Disconnect the following cables from the system board:

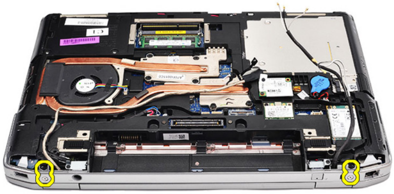
   - LVDS
   - camera
   - touch screen



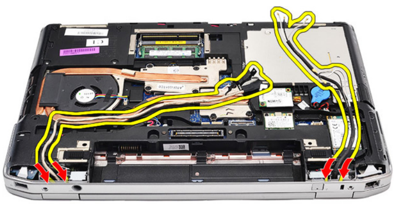
8. Unthread the cables.



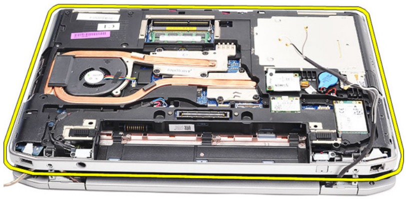
9. Remove the screws that secures the display assembly to the computer.



10. Lift up the computer base from the display assembly to release the LVDS cable and antenna cables from the computer.



11. Remove the computer by disengaging it from the system assembly.



Installing The Display Assembly

1. Insert the low-voltage differential signaling (LVDS) cable and wireless antenna cables through the holes on the bottom base chassis.
2. Attach the display assembly hinges to the bottom base chassis.
3. Replace and tighten the screws to secure the display assembly to the computer.
4. Route the LVDS cable along its compartment and connect the connector to the system board.
5. Install the LVDS bracket.
6. Tighten the screws to secure the bracket in place.
7. Route the Wireless Local Area Network (WLAN) and/or Wireless Wide Area Network (WWAN) antennae along their compartments and connect the antennae to the WLAN and/or WWAN module.
8. Install the *base cover*.
9. Install the *battery*.
10. Follow the procedures in *After Working Inside Your Computer*.

Display Bezel

30

Removing The Display Bezel

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Pry the display bezel from inside the display assembly.



4. Remove the display bezel.



Installing The Display Bezel

1. Place the display bezel onto the display assembly.
2. Starting from the top corner, press on the display bezel and work around the entire bezel until is snaps onto the display assembly.
3. Press on the left and right edges of the display bezel.
4. Install the *battery*.
5. Follow the procedures in *After Working Inside Your Computer*.

Display Panel 31

Removing The Display Panel

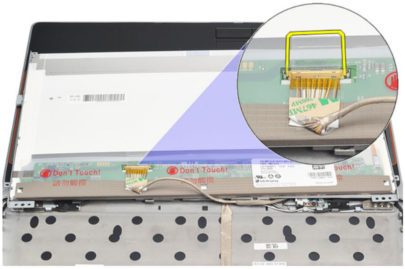
1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *display bezel*.
4. Remove the screws that secures the display panel to the computer.



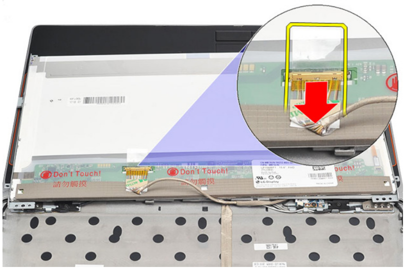
5. Flip the display panel over the keyboard.



6. Peel the tape from the low-voltage differential signaling (LVSD) cable connector.



7. Disconnect the LVSD cable from the display panel.



8. Remove the display panel from the computer.



Installing The Display Panel

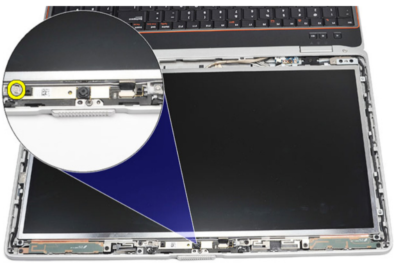
1. Align the display panel in its original position in the computer.
2. Connect the low-voltage differential signaling (LVSD) cable to the display panel and attach the tape.
3. Tighten the screws securing the display panel to the computer.
4. Install the *battery*.
5. Install the *display bezel*.
6. Follow the procedures in *After working inside your computer*.

Camera

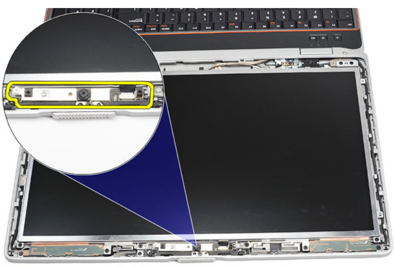
32

Removing The Camera

1. Follow the procedures in *Before Working On Your Computer*.
2. Remove the *battery*.
3. Remove the *display bezel*.
4. Loosen the screw that secures the camera module.



5. Disconnect the cable and remove the camera module.



Installing The Camera

1. Replace the camera module in position and connect the cable.
2. Tighten the screw to secure the camera module.
3. Install the *display bezel*.
4. Install the *battery*.
5. Follow the procedures in *After working inside your computer*.

Specifications 33

Technical Specifications

NOTE: Offerings may vary by region. The following specifications are only those required by law to ship with your computer. For more information regarding the configuration of your computer, click **Start** → **Help and Support** and select the option to view information about your computer.

System Information	
Chipset	Intel Mobile Express Series 6 chipset
DRAM bus width	64-bit
Flash EPROM	SPI 32 Mbits
PCIe Gen1 bus	100 MHz

Processor	
Types	• Intel Core i3 series • Intel Core i5 series with Turbo BoostTechnology 2.0 • Intel Core i7 series with Turbo BoostTechnology 2.0
L2 cache	up to 6 MB
External bus frequency	1333 MHz

Memory	
Memory connector	two SODIMM slots
Memory capacity	1 GB, 2 GB, or 4 GB
Memory type	DDR3 SDRAM (1333 MHz)
Minimum memory	2 GB
Maximum memory	8 GB

Audio	
Type	four-channel high definition audio
Controller	IDT 92HD90
Stereo conversion	24-bit (analog-to-digital and digital-to-analog)
Interface:	
Internal	high definition audio
External	microphone-in/stereo headphones/external speakers connector
Speakers	two
Internal speaker amplifier	0.5 W (typical) per channel
Volume controls	keyboard function keys and program menus

Video	
Video type	• integrated on system board • discrete
Data bus:	
UMA	integrated video
Discrete	• PCI-E x16 Gen1 • PCI-E x16 Gen2
Video controller:	
UMA	Intel HD Graphics
Discrete	NVIDIA NVS 4200M Discrete Graphics (512 MB DDR3)

Communications	
Network adapter	10/100/1000 Mbps Ethernet LAN
Wireless	internal wireless local area network (WLAN) and wireless wide area network (WWAN)

Ports and Connectors	
Audio	one microphone connector/stereo headphone/speakers connector
Video	• one 15-pin VGA connector • one 19-pin HDMI connector
Network adapter	one RJ-45 connector
USB	three 4-pin USB 2.0-compliant connectors and one eSATA/USB 2.0-compliant connector
Memory card reader	one 5-in-1 memory card reader
IEEE 1394:	one 4-pin connector

Contactless Smart Card	
Supported Smart Cards/Technologies	ISO14443A — 106 kbps, 212 kbps, 424 kbps, and 848 kbps ISO14443B — 106 kbps, 212 kbps, 424 kbps, and 848 kbps ISO15693 HID iClass FIPS201 NXP Desfire

Display	
Type	WLED display
Size	15.6 inch high definition (HD)
Dimensions:	
Height	210.00 mm (8.26 inches)
Width	360.00 mm (14.17 inches)
Diagonal	396.24 mm (15.60 inches)
Active area (X/Y)	344.23 mm x 193.54 mm
Maximum resolution	1366 x 768 pixels at 262K colors
Maximum Brightness	220 nits
Operating angle	0° (closed) to 135°
Refresh rate	60 Hz
Minimum Viewing angles:	

Display	
Horizontal	+/- 60°
Vertical	+/- 50°
Pixel pitch	0.252 mm

Keyboard	
Number of keys:	United States: 101 keys United Kingdom: 102 keys Brazil: 104 keys Japan: 105 keys
Layout	QWERTY/AZERTY/Kanji

Touchpad	
Active Area:	
X-axis	80.00 mm
Y-axis	40.70 mm

Battery	
Type	• 4-cell "smart" lithium ion • 6-cell "smart" lithium ion • 9-cell "smart" lithium ion
Dimensions:	
4-cell and 6-cell	
Depth	48.08 mm (1.90 inches)
Height	20.00 mm (0.79 inches)
Width	208.00 mm (8.19 inches)
9-cell	
Depth	71.79 mm (2.83 inches)
Height	20.00 mm (0.79 inches)
Width	214.00 mm (8.43 inches)
Weight:	

Battery	
4-cell	240.00 g (0.53 lb)
6-cell	345.00 g (0.76 lb)
9-cell	524.00 g (1.16 lb)
Charge time for a 4-cell and 6-cell battery with computer off (with 90 W adapter)	approximately 1 hour to 80% capacity and 2 hours to 100% capacity.
Voltage	
4-cell	14.80 VDC
6-cell and 9-cell	11.10 VDC
Temperature range:	
Operating	0 °C to 35 °C (32 °F to 95 °F)
Non-Operating	–40 °C to 65 °C (–40 °F to 149 °F)
Coin-cell battery	3 V CR2032 lithium coin cell

AC Adapter	
Type	65 W, 90 W, and 150 W **NOTE:** 65 W AC adapter is available only for computers with integrated video card.
Input voltage	100 VAC to 240 VAC
Input current (maximum)	1.50 A/1.60 A/1.70 A/2.10 A
Input frequency	50 Hz to 60 Hz
Output power	65 W, 90 W, and 150 W
Output current	3.34 A, 4.62 A and 7.70 A (continuous)
Rated output voltage	19.5 +/– 1.0 VDC
Temperature range:	
Operating	0 °C to 40 °C (32 °F to 104 °F)
Non-Operating	–40 °C to 70 °C (–40 °F to 158 °F)

Physical	
Height	28.30 mm to 34.20 mm (1.11 inches to 1.35 inches)
Width	384.00 mm (15.11 inches)
Depth	258.00 mm (10.16 inches)
Weight (with 4-cell battery)	2.50 kg (5.51 lb)

Environmental	
Temperature:	
Operating	0 °C to 35 °C (32 °F to 95 °F)
Storage	–40 °C to 65 °C (–40 °F to 149 °F)
Relative humidity (maximum):	
Operating	10 % to 90 % (noncondensing)
Storage	5 % to 95 % (noncondensing)
Altitude (maximum):	
Operating	–15.2 m to 3048 m (–50 ft to 10,000 ft)
Non-Operating	–15.2 m to 10,668 m (–50 ft to 35,000 ft)
Airborne contaminant level	G1 as defined by ISA-71.04–1985

System Setup 34

System Setup Overview

System Setup allows you to:

- change the system configuration information after you add, change, or remove any hardware in your computer.
- set or change a user-selectable option such as the user password.
- read the current amount of memory or set the type of hard drive installed.

Before you use System Setup, it is recommended that you write down the System Setup screen information for future reference.

CAUTION: Unless you are an expert computer user, do not change the settings for this program. Certain changes can cause your computer to work incorrectly.

Entering System Setup

1. Turn on (or restart) your computer.
2. When the blue DELL logo is displayed, you must watch for the F2 prompt to appear.
3. Once the F2 prompt appears, press <F2> immediately.

NOTE: The F2 prompt indicates that the keyboard has initialized. This prompt can appear very quickly, so you must watch for it to display, and then press <F2> . If you press <F2> before you are prompted, this keystroke will be lost.

4. If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then, shut down your computer and try again.

System Setup Menu Options

The following sections describe the menu options for the System Setup program

General

The following table describe the menu options of the **General** menu.

Option	Description
System Information	This section lists the primary hardware features of your computer. • System Information • Memory Information • Processor Information • Device Information
Battery Information	Displays the battery status and the type of AC adapter connected to the computer.
Boot Sequence	Allows you to change the order in which the computer attempts to find an operating system. • Diskette Drive • Internal HDD • USB Storage Device • CD/DVD/CD-RW Drive • Onboard NIC • Cardbus NIC You can also choose the Boot List option. The options are: • Legacy • UEFI
Date/Time	Allows you to change the date and time.

System Configuration

The following table describe the menu options of the **System Configuration** menu.

Option	Description

NOTE: System Configuration contains options and settings related to integrated system devices. Depending on your computer and installed devices, the items listed in this section may or may not appear.

Option	Description
Integrated NIC	Allows you to configure the integrated network controller. The options are:

Option	Description
	• Disabled • Enabled • Enabled w/PXE Default Setting: **Enabled w/PXE**
System Management	Allows you to control the systems management mechanism. The options are: • Disabled • DASH/ASF 2.0 Default Setting:**DASH/ASF 2.0**
Parallel Port	Allows you to configure the parallel port on the docking station. The options are: • Disabled • AT • PS2 • ECP Default Setting: **AT**
Serial Port	Allows you to configure the integrated serial port. The options are: • Disabled • COM1 • COM2 • COM3 • COM4 Default Setting: **COM1**
SATA Operation	Allows you to configure the internal SATA hard-drive controller. The options are: • Disabled • ATA • AHCI • RAID On Default Setting: **RAID On**

Option	Description
	NOTE: SATA is configured to support RAID mode.
USB Controller	Allows you to control the USB controller. The options are: • Enable Boot Support • Enable External USB Port Default Setting: **Enable USB Controller and Enable External USB Port**
Miscellaneous Devices	Allows you to enable or disable the following devices: • Internal Modem • Microphone • eSATA Ports • Hard Drive Free Fall Protection • Module Bay • ExpressCard • Camera You can also enable or disable: • Media Card and 1394 • Enable Media Card only • Disable Media Card and 1394 Default Setting: **Media Card and 1394**
Keyboard illumination	Allows you to configure the keyboard illumination feature. The options are: • Disabled • Level is 25% • Level is 50% • Level is 75% • Levels is 100% Default Setting: **Level is 25%**
Drives	Allows you to configure the SATA drives on board. The options are:

Option	Description
	• SATA-0 • SATA-1 • SATA-4 • SATA-5 Default Setting: All drives are enabled.

Video

The following table describe the menu options of the **Video** menu.

Option	Description
LCD Brightness	Allows you to set the display brightness depending up on the power source (On Battery and On AC).
Enable Optimus	This option enables or disables the Nvidia Optimus Technology applicable to Windows 7 only.

Security

The following table describe the menu options of the **Security** menu.

Option	Description
Admin Password	Allows you to set, change, or delete the administrator (admin) password. **NOTE:** You must set the admin password before you set the system or hard drive password. **NOTE:** Successful password changes take effect immediately. **NOTE:** Deleting the admin password automatically deletes the system password and the hard drive password. **NOTE:** Successful password changes take effect immediately. Default Setting: **Not set**

Option	Description
System Password	Allows you to set, change or delete the system password. NOTE: Successful password changes take effect immediately. Default Setting: **Not set**
Internal HDD-0 Password	Allows you to set or change the system's internal hard-disk drive. NOTE: Successful password changes take effect immediately. Default Setting: **Not set**
Password Bypass	Allows you to enable or disable the permission to bypass the System and the Internal HDD password, when they are set. The options are: • Disabled • Reboot bypass Default Setting: **Disabled**
Password Change	Allows you to enable the disable permission to the System and Hard Drive passwords when the admin password is set. Default Setting: **Allow Non-Admin Password Changes** is selected
Strong Password	Allows you to enforce the option to always set strong passwords. Default Setting: **Disabled**
OROM Keyboard Access	Allows you to set an option to enter the Option ROM Configuration screens using hotkeys during boot. The options are: • Enable • One Time Enable • Disable Default Setting: **Enable**

Option	Description
TPM Security	Allows you to enable the Trusted Platform Module (TPM) during POST. Default Setting: **Disabled**
Computrace	Allows you to activate or disable the optional Computrace software The options are: • Deactivate • Disable • Activate **NOTE:** The Activate and Disable options permanently activates or disables the feature and no further changes are allowed Default Setting: **Deactivate**
CPU XD Support	Allows you to enable the Execute Disable mode of the processor. Default Setting: **Enabled**
Non-Admin Setup Changes	Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set. If disabled the setup options are locked by the admin password. Default Setting: **Disabled**
Password Configuration	Allows you to determine the minimum and maximum length of Administrator and System passwords.
Admin Setup Lockout	Allows you to prevent users from entering Setup when an Administrator password is set. Default Setting: **Disabled**

Performance

The following table describe the menu options of the **Performance** menu.

Option	Description
Multi Core Support	Allows you to enable or disable multi-core support for the processor. The options are: • All • 1 • 2 Default Setting: **All**
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep feature. Default Setting: **Enabled**
C-States Control	Allows you to enable or disable the additional processor sleep states. Default Setting: The options **C states**, **C3**, **C6**, **Enhanced C-states**, and **C7** options are selected/enabled.
Limit CPUID	Allows you to limit the maximum value the processor Standard CPUID Function will support. Default Setting: **Enable CPUID Limit**
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. Default Setting: **Enabled**
HyperThread Control	Allows you to enable or disable the HyperThreading in the processor. Default Setting: **Enabled**

Power Management

The following table describe the menu options of the **Power Management** menu.

Option	Description
AC Behavior	Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected. Default Setting: **Disabled**

Option	Description
Auto On Time	Allows you to set the time at which the computer must turn on automatically. The options are: • Disabled • Every Day • Weekdays Default Setting: **Disabled**
USB Wake Support	Allows you to enable USB devices to wake the system from Standby. Default Setting: **Disabled** **NOTE:** This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the system setup will remove power from all of the USB ports to conserve battery power.
Wireless Radio Control	Allows you to enable or disable the feature that automatically switches from wired or wireless networks without depending on the physical connection. Default Setting: The options **Control WLAN radio** and **Control WWAN radio** are selected.
Wake on LAN/WLAN	This field allows the computer to power up from the off state when triggered by a special LAN signal or from Hibernate state when triggered by a special wireless LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system. This feature only works when the computer is connected to AC. • Disabled — Do not allow the system to power on when it receives a wake-up signal from the LAN or wireless LAN. • LAN Only — Allow the system to be powered on by special LAN signals.

Option	Description
	• WLAN Only — Allow the system to be powered on by special WLAN signals. • LAN or WLAN — Allow the system to be powered on by special LAN or wireless LAN signals. Default Setting: **Disabled**
ExpressCharge	Allows you to enable or disable the ExpressCharge feature. The options are: • Standard • ExpressCharge Default Setting: **ExpressCharge**

POST Behavior

The following table describe the menu options of the **POST Behavior** menu.

Option	Description
Adapter Warnings	Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters. Default Setting: **Enable Adapter Warnings** is selected.
Keypad (Embedded)	Allows you to choose one or two methods to enable the keypad that is embedded in the internal keyboard. • Fn Key Only • By Num Lk Default Setting: **Fn Key Only**
Mouse/Touchpad	Allows you to define how the system handles mouse and touch pad input. The options are: • Serial Mouse • PS2 Mouse • Touchpad/PS-2 Mouse Default Setting: **Touchpad/PS-2 Mouse**

Option	Description
Numlock Enable	Allows you to enable the Numlock option when the computer boots. Default Setting: **Enable Numlock** is selected.
Fn Key Emulation	Allows you to set the option where the <Scroll Lock> key is used to simulate the <Fn> key feature. Default Setting: **Enable Fn Key Emulation** is selected.
POST HotKeys	Allows you enable the sign-on screen message display indicating the keystroke sequence to access the System Setup option menu. Default Setting: **Enable F12 Boot Option Menu** is selected.
Fastboot	Allows to set the option to speed up the boot process. The options are: • Minimal • Thorough • Auto Default Setting: **Thorough**

Virtualization Support

The following table describe the menu options of the **Virtualization Support** menu.

Option	Description
Virtualization	Allows you to enable or disable the Intel Virtualization Technology. Default Setting: **Enable Intel Virtualization Technology** is selected.
VT for Direct I/O	Allows you to enable or disable Virtualization Technology for Direct I/O. Default Setting: **Disabled** is selected.
Trusted Execution	This option specifies wether a Measured Virtual Machine Monitor (MVMM) can

Option	Description
	utilize the additional hardware capabilities provided by Intel Trusted Execution Technology. The TPM Virtualization Technology and Virtualization Technology for Direct I/O must be enabled to use this feature. Default Setting: **Disabled** is selected.

Wireless

The following table describe the menu options of the **Wireless** menu.

Option	Description
Wireless Switch	Allows to set the wireless devices that can be controlled by the wireless switch. The options are: • WWAN • WLAB • Bluetooth Default Setting: All the options are selected.
Wireless Device Enable	Allows you to enable or disable the wireless devices Default Setting: All the options are selected.

Maintenance

The following table describe the menu options of the **Maintenance** menu.

Option	Description
Service Tag	Displays the Service Tag of your computer. **NOTE:** If a Service Tag has not been set for this system, the computer will automatically bring up this screen when users enter the BIOS. You will be prompted to enter the Service Tag.
Asset Tag	Displays the Asset Tag.

System Logs

The following table describe the menu options of the **System Logs** menu.

Option	Description
BIOS Events	Allows you to view and clear the System Setup (BIOS) POST events.
DellDiag Events	Allows you to view and clear the DellDiag events.
Thermal Events	Allows you to view and clear the Thermal events.
Power Events	Allows you to view and clear the Power events.

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Device Status Lights

	Turns on when you turn on the computer and blinks when the computer is in a power management mode.
	Turns on when the computer reads or writes data.
	Turns on steadily or blinks to indicate battery charge status.
	Turns on when wireless networking is enabled.

Battery Status Lights

If the computer is connected to an electrical outlet, the battery light operates as follows:

- **Alternately blinking amber light and blue light** — An unauthenticated or unsupported non-Dell AC adapter is attached to your laptop.
- **Alternately blinking amber light with steady blue light** — Temporary battery failure with AC adapter present.
- **Constantly blinking amber light** — Fatal battery failure with AC adapter present.
- **Light off** — Battery in full charge mode with AC adapter present.
- **Blue light on** — Battery in charge mode with AC adapter present.

LED Error Codes

The following table shows the possible LED codes that may display when your computer is unable to complete a power on self test.

Appearance			Description	Next Step
				
Blinking	Solid	Solid	The micro-controller is	Replace the processor.

Appearance			Description	Next Step
			handing control of the system to the processor. This code persists if no processor is detected.	
Solid	Blinking	Solid	Memory is detected but has errors.	1. Reseat the memory. 2. If two modules are installed remove one and test. Try the other module in the same slot and test. Test the other slot with both modules. 3. Replace the memory. 4. Replace the system board.
Blinking	Blinking	Blinking	System board error	Replace the system board.
Blinking	Blinking	Solid	Video card error	Replace the system board.
Blinking	Blinking	Off	Keyboard error	1. Reseat the keboard cable. 2. Replace the keyboard.
Blinking	Off	Blinking	USB controller error	Unplug the USB device (if any)
Solid	Blinking	Blinking	No SODIMMs are installed.	1. Install supported memory modules. 2. If memory is already present, reseat the module(s) one at a time in each slot. 3. Try known good memory from another computer or replace the memory.

Appearance			Description	Next Step
				4. Replace the system board.
Blinking	Solid	Blinking	Display panel error	1. Reseat the display cable. 2. Replace the display panel. 3. Replace the video card/ system board.
Off	Blinking	Blinking	Modem error	1. Reseat the modem. 2. Replace the modem. 3. Replace the system board.

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Contacting Dell

NOTE: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1. Visit **support.dell.com**.
2. Select your support category.
3. If you are not a U.S. customer, select your country code at the bottom of the page, or select **All** to see more choices.
4. Select the appropriate service or support link based on your need.